

REMARKS

Indefiniteness

Claims 15-20 and 31 stand rejected under 35 U.S.C. § 112, second paragraph for being indefinite. In particular, the Action states that the use of the term “predetermined degree of finish” is unclear because (1) the extent of finish and extent of predetermination are unclear, and (2) the predetermined degree of finish is inherent since the effects of molding are somewhat predictable and dependent on the materials used.

The claims are not indefinite, however, because the use of the term “predetermined degree of finish” is clear from the language used in claim 15. In particular, the method of claim 15 requires the step of “providing a mold having a mold surface having a predetermined degree of finish.” Thus, “predetermined degree of finish” is dictated by the mold surface construction, not by the actual surface characteristics of a molded product made by the method.

Claim 15 also includes the step of “allowing the preform . . . to form a substrate having a clear-coat surface with substantially the predetermined degree of finish.” Thus, the substrate formed has a clear-coat surface with substantially the same “predetermined degree of finish” as the surface of the mold. The extent of predetermination and degree of finish are a property of the mold surface construction only. “Predetermined degree of finish” is only related to the surface of a molded product of the method to the extent that the molded product’s surface is substantially the same as the mold surface.

Thus as used in claim 15, the phrase “predetermined degree of finish” is clear and definite. Thus claim 15 accords with the requirements of 35 U.S.C. § 112, second paragraph. As well, claims 16-20 and 31, being dependent upon claim 15, are also clear and definite.

Obviousness

Pending claims 15-20 and 31-37 are rejected for being obvious in light of a combination of Aizawa et al (U.S. Patent No. 4,501,790), Makhlouf et al. (U.S. Patent

No. 4,550,060), Crast et al (U.S. Patent No. 6,365,679), and Matzinger et al (U.S. Patent No. 5,000,903).

The method of claim 15 for preparing a plastic part with a clear-coat surface includes the required steps of spraying a clear-coat mixture onto a mold surface, the surface having a predetermined degree of finish; applying a substrate-form material, so as to create an uncured preform; and allowing the preform to cure so as to form a substrate having a clear-coat surface with substantially the predetermined degree of finish of the mold surface.

Method claim 32 is similar to claim 15, though the surface of the mold has “minimal surface roughness” and the clear coat surface has “a high gloss finish.” In addition, the claim requires that the total coating thickness is substantially between 3.0 to 4.0 mils DFT.

All other pending claims are dependent from either claim 15 or 32.

None of the references, alone or in combination, teach or suggest either independent method claim using the required steps. As such a prima facie case of obviousness does not exist.

A. Aizawa and Crast

1. Aizawa and Crast do not teach a method of making a substrate having a clear-coat surface with substantially the predetermined degree of finish required by claim 15

Claim 15 requires “form[ing] a substrate having a clear-coat surface with substantially the predetermined degree of finish” of the mold surface. Aizawa’s in-mold method is directed toward a molded product having a sealer coating film. The sealer film has a pigment, and is thus not a clear-coat surface.

The Action states that “it would have been prima facie obvious to use a sealer coating without added pigment” since “[t]he minute amount of pigment present in the sealer layer would not have affected the properties of the coating.” Aizawa, however, provides evidence that, regardless of whether pigment removal is obvious, the sealer layer is not a “clear coat surface with substantially the predetermined degree of finish” as required by claim 15.

a. Aizawa indicates that the sealer film will blur

As noted previously in Applicants' response of September 3, 2003, Aizawa specifically states that

“absorption of the solvent of the top coating film into the surface of the primer coating film is prevented by the sealer coating film and, therefore no blur arises in the top coating film.”

See Aizawa, column 11, lines 54-57. Therefore, removal of pigment from the sealer coating film would not result in a “clear-coat surface with substantially the predetermined degree of finish” of the mold surface because the surface would be blurred. Nothing prevents the penetration of the solvent in the sealer layer from penetrating to the primary coating film and blurring the sealer film. Indeed, this provides motivation why Aizawa cannot provide a clear top-coat by an in-mold method: with blurring, the surface would not be “a clear-coat surface with substantially the predetermined degree of finish” of the mold surface, as required by claim 15.

b. Aizawa teaches a post-mold application of the top coat and does not teach that films formed by the in-mold method have a “good finish”

Though the Action states that the coating layers of Aizawa have “good finish” due to the aluminum incorporation or film thicknesses, and are thus substantially predetermined, the referenced sections of Aizawa do not teach or suggest a “clear-coat surface with substantially the predetermined degree of finish” of the mold surface.

Aizawa, from column 6, line 65 to column 7, line 61, reveals “good finish” qualities of a molded part's top coat, which is applied post-molding – not of a sealer film or primary film made by the in-mold process. See Aizawa, column 6, lines 54-61. The sections of Aizawa discusses the effects of the appearance of the sprayed-on top-coat due to alterations in the thickness of the primer layer, the amount of aluminum flakes in the primer layer, and the amount of glass fibers in the urethane molding. There is no discussion of the qualities of the surface of the in-mold product after molding alone, just the surface of the product after the spray application of the top coat. Furthermore, a number of the embodiments discussed do not refer to the in-mold method of applying layers at all. Thus Aizawa provides no suggestion or teaching that the in-mold method

could produce a product with a “clear-coat surface with substantially the predetermined degree of finish” of the mold surface.

Crast is not directed to an in-mold method, so it does not provide the element of the “clear-coat having substantially the predetermined degree of finish” of the mold surface.

2. Aizawa teaches away from an in-mold method for making layers of the thicknesses required by claim 32

Independent claim 32 is also nonobvious for the same reasons previously discussed with regard to claim 15. Furthermore, claim 32 is nonobvious because the claim requires that the clear coat mixture and pigmented mixture “form a total coating layer thickness substantially between 3.0 to 4.0 mils DFT” which is not taught by Aizawa and Crast.

The Action suggests that the combination of the primer layer, sealing layer, and top-coat layer has a combined thickness that is within the claimed range. But such a combination does not make claim 32 obvious because it does not teach the steps of the method. Specifically, claim 32 has layers that are applied by an in-mold method. The top coat layer of Aizawa has never been shown to be applied by an in-mold method, the layer is sprayed on *after* in-mold processing. The Action states as much by indicating that “Aizawa does not seem to indicate the spraying of the top-coat into the mold during the in-mold coating process.” See Office Action of December 5, 2003, page 6, item 19. Thus Aizawa does not teach an in-mold method for making the appropriate layer thickness.

Furthermore, as discussed in the Applicants’ response of September 3, 2003, Aizawa *teaches away* from a combination of layers by an in-mold method with a thickness greater than 2.4 mils. Aizawa specifically states that thicker layers will cause the films to sag and be rough; thus they cannot have “a high gloss finish” as required by claim 32. See Aizawa column 10, lines 56-60; and column 11, lines 7-9. Thus Aizawa teaches away from making a thicker primer layer or sealer layer to meet the requirements of claim 32.

Crast is, again, not directed to an in-mold method, so it does not provide the element of the “clear-coat having substantially the predetermined degree of finish” of the mold surface.

Thus claims 15 and 32 are allowable over an obviousness rejection based upon Aizawa and Crast.

3. Dependent Claims

Since the remaining pending claims depend from either claim 15 or 32, such claims are all allowable for the reasons that claims 15 and 32 are allowable.

Furthermore, claim 20, dependent from claim 15, is nonobvious because Aizawa does not teach or suggest the volume fraction of solids required by the claim. The Action states it would be obvious to use any solids content necessary to optimize spraying capabilities since dilution of viscosity of solvents is known in the art. Such a statement is impermissible hindsight in light of the teachings of the Application. The Application teaches the optimality of such compositions in terms of “working time” and “gel time”, as established by experimentation. See Application, page 10, lines 10 – 24. There is no suggestion or teaching in any of the cited art as to the optimality of such a range of volume fraction of solids to obtain a desired combination of “working time” and “gel time”. Claim 20 is not obvious. Claim 37 is also not obvious for substantially similar reasons.

B. Aizawa, Crast, and Makhlouf

Pending claims 15-20 and 31-37 are further rejected as being obvious over a combination of Aizawa, Crast, and Makhlouf. In particular it is noted that “Makhlouf teaches that polyurethane dispersion coatings with or without pigments may be used in an in-mold coating process to provide smooth, defect-free coatings on a fiberglass-reinforced surface.” See Office Action, page 6, item 19. Though Makhlouf uses the term “in-mold coating process,” the reference provides no teaching or suggestion of the methods of the pending claims because Makhlouf does not teach necessary steps of the claims. As well, the combination of Aizawa and Makhlouf teach away from the pending claims.

All pending claims require the steps of:

spraying [a] clear coat mixture to directly contact the . . . mold surface;
spraying [a] pigmented mixture . . . onto the clear-coat mixture . . . ;
applying, over the sprayed pigmented mixture, a substrate-forming material . . . to
create an uncured preform; and
allowing the preform to cure . . . to form the substrate having a clear-coat surface”

Makhlouf teaches a method of coating a molded article by applying a coating composition to a *molded article* while still in the mold, closing the mold, and applying pressure such that the coating composition substantially and uniformly covers the molded article surface. See Makhlouf, column 6, line 67 to column 7, line 7; column 8, lines 46-62; column 9, lines 1-16. That is, Makhlouf requires that the molded article be formed and cured. See Makhlouf, column 9, lines 1-4 (stating that the composition is charged to a molded thermoset (i.e., cured) article). Subsequently, the mold is opened, composition is applied, and the mold closed and pressurized to form the coating layer.

The pending claims require spraying the clear-coat and pigmented mixtures, applying substrate-forming material that forms an uncured preform, then curing the preform to form a substrate with the coating layer. Makhlouf provides no teaching or suggestion of such a method.

Aizawa combined with Makhlouf teach away from the pending claims. As discussed earlier, Aizawa’s sealer film cannot be a clear-coat layer, even if pigment is removed, because the surface will blur. Makhlouf teaches that a molded piece must be preformed before a layer is applied on top of the molded piece. Thus, Makhlouf provides no teaching or suggestion that an in-mold clear-coat surface may be formed over a molded product while curing the product. Indeed, the combination of Aizawa (requiring spraying of a clear-coat after in-mold formation) and Makhlouf (requiring the mold product be completed before a coating layer may be formed on top thereof) suggests that methods of the pending claims cannot be achieved. Thus the claims are not obvious.

Crast is not directed to an in-mold method, and provides no further teaching or suggestion that a clear-coat may be formed by an in-mold method.

Thus the pending claims are allowable over an obviousness rejection in light of Aizawa, Crast, and Makhoulf.

Conclusion

In view of the arguments presented, among others, the Applicants respectfully request reconsideration of claims 15 – 20 and 31 – 37. Acceptance of the pending claims is cordially requested.

Dated: March 5, 2004

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Charlton Shen', with a long horizontal flourish extending to the right.

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